WHAT IS CLAIMED IS:

1. A method for controlling a Mach-Zehnder modulator used in a transmission system, the method comprising the steps of:

filtering a binary electrical drive signal to produce a unit modulation pulse spanning four-bit-periods and describable by three parameters;

adjusting one or more of the three parameters of the unit modulation pulse to optimize a figure of merit associated with performance of the transmission system; and

generating, from the unit modulation pulse, a three-level electrical drive signal for input to the Mach-Zehnder modulator.

2. The method of claim 1 where the three parameters are each defined over a half-bit period and together are sufficient to describe a line-coded transmission eye diagram.

3. The method of claim 1 where the three parameters are further defined as a, b, and c, respectively and describable by

$$a(t)=\frac{1-\alpha}{2}\left[1-\sin\left((1-t)\frac{\pi}{2}\right)\right]^{\eta},\ b(t)=\frac{1-\alpha}{2}\left[1-\sin\left(t\frac{\pi}{2}\right)\right]^{\eta}, \text{ and}$$

$$c(t)=\alpha\left[\cos(t\pi)\right]^{\xi}$$

for some α, η and ξ.

4. The method of claim 1 where the step of adjusting is performed so that performance of the transmission system is enhanced at set levels of net chromatic dispersion.

5. A transmitter comprising:

an input for receiving a binary electrical drive signal;

a filter for filtering the received binary electrical drive signal to produce a transmission having a unit modulation pulse with substantially three levels, which unit pulse produces optimized transmission performance over a set of values of net chromatic dispersion; and

a modulator coupled to the filter to receive a filtered three-level electrical drive signal.

6. The transmitter of claim 5, further including a controller coupled to the filter for selectively varying the unit modulation pulse to further enhance the transmission performance in accordance with optimization criteria

7. The transmitter of claim 5, where the optimization criteria include the minimization of dispersive impairments penalties in transmitter performance.